



Growing Smarter Implementation Project
Best Practices Paper #6

Transit Oriented Development

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TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Importance of the Issue to MAG Member Agencies	1
2.	TRANSIT ORIENTED DEVELOPMENT DEFINED	2
3.	RELEVANCE OF TOD TO MAG REGION.....	3
4.	BENEFITS AND COSTS.....	4
5.	URBAN DESIGN ELEMENTS	6
5.1	Integrate Transit and Land Use Planning; Mixture of Land Uses	7
5.2	Does the MAG Region Have Sufficient Density to Support Transit?	9
5.3	Pedestrian and Bicycling Facilities.....	11
5.4	Parking	13
5.5	Prominent Public Spaces.....	13
6.	SUCCESSFUL EXAMPLES	15
6.1	King County Department of Transportation – Seattle, Washington.....	15
6.2	Regional Transportation District – Denver, Colorado.....	15
6.3	San Diego Metropolitan Transit Development Board	16
7.	IMPLEMENTATION.....	16
7.1	Challenges to Creating Transit Oriented Development	16
7.1.1	Fiscal Constraints.	17
7.1.2	Organizational Constraints.....	17
7.1.3	Political Constraints.	17
7.2	Overcoming the Implementation Barriers	18
7.2.1	Fiscal Constraints.....	18
7.2.2	Organizational Constraints.....	19
7.2.3	Political Constraints.....	19
7.3	Resources for MAG Member Agencies.....	20
7.3.1	MAG Pedestrian Area Policies and Design Guidelines.....	20
7.3.2	Valley Metro Pedestrian-oriented Design (PeD) Standards and Design Guidelines.	21
7.3.3	Light Rail Transit; Phoenix, Arizona – Economic Development along the Planned Light-Rail Line.	22
7.3.4	City of Phoenix Transit Overlay District.....	23
8.	SUMMARY	25
	APPENDIX A: City of Phoenix interim transit-Oriented District Overlay Zoning Ordinance	26
	BIBLIOGRAPHY.....	42

1. INTRODUCTION

This paper is a component of the Maricopa Association of Governments (MAG) Regional Growing Smarter Implementation (GSI) Project. The goal of the GSI project is to assist local agencies in complying with the Growing Smarter and Growing Smarter Plus laws and regulations by addressing timely topics and issues faced by planners in the MAG region. This paper is the final paper in a series of six, aimed at sharing information and highlighting innovative solutions for potential use by member agencies.

Topics for the working papers were selected from planning issues identified by MAG member agencies as well as the State Land Department, Pinal County, and Casa Grande. Planners were asked what they consider the most important planning issues, both within and outside their jurisdictions. This information was then compiled into a survey and forwarded to the MAG Planners Stakeholders Group for prioritization. Some of the topics were later modified to respond to specific requests of members who voted at the March 1, 2002 Group meeting to finalize the topics. The six topics are:

1. Affordable Housing Policy
2. Adequate Facilities Ordinance
3. Fiscal Impact Fees Comparison
4. Intergovernmental Planning
5. Infill Development
6. Transit Oriented Development

This paper begins by describing some of the comments received from the stakeholder interviews to frame the Transit Oriented Development (TOD) issue. The paper continues with a working definition of TOD, and identifies benefits and costs associated with TOD. Important urban design elements are then discussed, and successful examples of TOD from throughout United States are provided. The paper closes by highlighting implementation issues and their resolution.

1.1 Importance of the Issue to MAG Member Agencies

In interviews with planning department staff, several reasons were given for selecting TOD as a topic for a GSI working paper, including:

- Within six years, the first leg of a 20.3-mile, billion-dollar light rail, transit system will be completed. It is important to develop TOD policies now, so that inappropriate development does not preclude the opportunity to develop vital, mixed-use transit nodes. Although it is possible for development to incrementally occur at transit stops, strategic planning will increase the likelihood that this development will function well.

The light rail system will expand opportunities for access to employment and education for minorities and lower income groups. This will, to some extent, mitigate the problems created by a lack of dispersed affordable housing.

- A commitment to TOD means massing densities in these areas. A comprehensive policy to do this would also require lower densities in other areas. It is important to examine municipal policies and processes to ensure that they do not conflict with the potential for successful TODs.
- It is important to create the right mix of uses to make transit nodes truly functional. Understanding some of the components of a successful TOD is helpful. How can these be created?

2. TRANSIT ORIENTED DEVELOPMENT DEFINED

Defining Transit Oriented Development (TOD) is the first step in addressing the issues noted above. This is not an easy task. TOD has received much attention as part of the “smart growth”, “new urbanism”, and “liveable neighborhoods” movements. “Smart growth” is generally seen as an alternative to “urban sprawl” with the goal of using resources more efficiently by reducing the amount of mobility required to access basic goods and services. “Smart growth” is a broad and evolving concept that generally includes higher densities; a mixture of land uses within proximity to one another; a pedestrian-scale development pattern; multi-modal transportation options that encourage transit use, bicycling and walking; traffic calming; and an emphasis on public spaces, such as parks, streetscapes, and public facilities (Victoria Transport Policy Institute 2002)¹.

TOD, like “Smart Growth”, is an evolving concept. In the early 1990s, Peter Calthorpe wrote the classic text *The Next American Metropolis: Ecology, Community and the American Dream*. In it he defined the TOD concept as follows, “...moderate and high-density housing, along with complementary public uses, jobs, retail and services, are concentrated in mixed-use developments at strategic points along the regional transit system.” He also asserts that there are three principles necessary for TOD:

“...first, that the regional structure of growth should be guided by the expansion of transit and a more compact urban form; second, that our ubiquitous single-use zonings should be replaced with standards for mixed-used, walkable neighborhoods; and third, that our urban design policies should create an architecture oriented toward the public domain and human dimension rather than the private domain and the auto scale.” (Calthorpe 1993, pp. 41)

¹ The Victoria Transport Policy Institute is an independent research organization dedicated to developing innovative and practical solutions to transportation problems. They are funded primarily through consulting and project grants. Their research is among the most current available and has been widely applied. They have a website which is listed in the Bibliography and their offices are in Victoria, BC, Canada.

Today, concepts of TOD seem to be more focused on design elements that enhance the use of public transit systems. There is no single definition of TOD. Defining transit-oriented development is challenging since many terms have been used to describe the basic idea of TOD, such as “transit villages,” “transit supportive development,” and “transit-friendly design” ((Transit Cooperative Research Program) TCRP 2002). According to the Victoria Transport Policy Institute,

“TOD refers to residential and commercial areas designed to maximize access by transit and non-motorized transportation, and with other features to encourage transit ridership. A TOD neighborhood has a center with a rail or bus station, surrounded by relatively high-density development, with progressively lower-density spreading outwards . . . TOD neighborhoods typically have a diameter of one-quarter to one-half mile (stations spaced half to one mile apart), which represents pedestrian scale distances (2002).”

Most definitions of TOD share common traits, including more intensive land uses near a bus or rail station, a mixture of land uses within a specific geographic area near a bus or rail station, and an increased modal share of transit, bicycling and walking (TCRP 2002). TOD neighborhoods have streets that encourage walking and bicycling by providing adequate roadway space for pedestrians and bicyclists, shade, and traffic calming features to control the speed of traffic. Mixed-use development includes a range of daily household travel destinations, such as schools, shops, and public services. In addition, TOD neighborhoods typically have a variety of housing styles and prices to meet the needs of a range of household types and incomes. TODs usually have parking management programs, which both limit the supply of parking and increase its cost to encourage transit, bicycle and pedestrian travel. (Victoria Transport Policy Institute 2002). Many of the elements in TOD definitions are also included in the concepts of “smart growth” and “new urbanism.”

3. RELEVANCE OF TOD TO MAG REGION

While transit may not yet be available in many areas of the MAG region, there are benefits to creating elements of the TOD concept in the absence of transit facilities. For example, providing walking and biking facilities, a variety of housing types and mixture of land uses prior to actual transit implementation helps to create a land use system that can support transit use, as transit becomes available. Community livability can also be enhanced through the implementation of TOD design concepts because TOD design principles typically include alternatives to the single-occupant vehicle, as well as vibrant streetscapes where human interaction is encouraged. The many benefits of TOD, discussed in the next section, can be realized by member agencies by utilizing design elements of TOD in any development project.

TOD concepts are especially relevant to cities interested in light rail transit (LRT). The current light rail plans for the region, as documented in MAG’s 2002 Long Range Transportation Plan, include a 39-mile system. The first segment of the line, the Central Phoenix/East Valley Light Rail Transit Project, is currently entering final design stage and is scheduled to begin construction in 2003. The 20.3 light rail starter segment extends from Bethany Home Road and 19th Avenue (formally Chris-Town Mall, recently renamed the Spectrum Mall) into downtown

Phoenix, downtown Phoenix to downtown Tempe and Arizona State University, and continuing to Main and Longmore in Mesa at the East Valley Institute of Technology.

The LRT will operate primarily at-grade on city streets and have two tracks, with light rail vehicles running in trains from one to three cars. The trains will run in both directions approximately 18 to 21 hours per day, seven days per week. The trains will initially operate every 10 minutes during peak hours and approximately every 20 minutes during off-peak hours.

Provisions for park-and-ride lots at the end of rail lines and signal priority strategies to improve speed are important elements of the light rail plan. Twenty-seven station locations have been identified along the alignment, with 21 scheduled for completion by opening day and six scheduled for development by 2010. Stations are generally located about a mile apart, but closer (½ mile apart) in urban centers. Shuttle buses and an improved fixed route network play an important, supportive role in the light rail system.

In addition to the initial segment of the LRT system, other extensions are possible. MAG is currently creating a High Capacity Transit Plan (HCT), which will identify potential commuter rail, and light rail/bus rapid transit corridors in the region. The analysis underlying this Plan reflects recent socioeconomic projections out to 2040. The results of the HCT will be incorporated into the Regional Transportation Plan (RTP), which is currently being developed by MAG. The RTP, which is considered the most significant regional transportation planning effort for several decades, will address the sustained growth that is expected over the next four or five decades. It is intended to provide a new policy framework to guide regional transportation investments, and to establish measures of performance that better monitor and improve the transportation system in the future. The RTP will also use this information to identify and prioritize the specific transportation projects necessary to keep pace with the increasing travel demands in the region.

4. BENEFITS AND COSTS

Table 1 on the following page summarizes potential benefits of TOD as gleaned from a recent report from the Transit Cooperative Research Program (TCRP), prepared by the California Department of Transportation. Table 1 provides this information verbatim (TCRP 2002).

There are also costs associated with TOD. Providing adequate levels of transit can cost a substantial amount of money, and the MAG region is currently developing a higher capacity transit system starting with the initial segment of the Central Phoenix/East Valley Light Rail Transit System. Capital costs for creating light rail can range from \$40 to \$60 million a mile, and capital costs for creating a commuter rail system can range from \$2 to \$20 million per mile. Other costs associated with TOD include providing enhanced bicycle and pedestrian amenities.

There are some potentially negative impacts associated with higher density development, such as increased congestion, and exposure to noise and air pollution. Increasing density has been known to reduce the amount of greenspace within an urbanized area. While these costs can be mitigated through design, these additional features often have costs as well (Victoria Transport Policy Institute 2002).

Table 1: Benefits of Transit Oriented Development

A recent study, *Factors for Success in California's Transit-Oriented Development*, commissioned by the California Department of Transportation, identified the following 10 potential benefits of TOD. The study cites research showing that TOD can:

1. **Provide mobility choices.** By creating “activity nodes” linked by transit, TOD provides important mobility options, very much needed in congested metropolitan areas. This also allows young people, the elderly, people who prefer not to drive, and those who don’t own cars the ability to get around.
2. **Increase public safety.** By creating active places that are busy through the day and evening and providing “eyes on the street,” TOD helps increase safety for pedestrians, transit-users, and many others.
3. **Increase transit ridership.** TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent, and up to five percent overall at the regional level.
4. **Reduce rates of vehicle miles traveled (VMT).** Vehicle travel in California has increase faster than the state’s population for many years. TOD can lower annual household rates of driving 20 - 40 percent for those living, working, and/or shopping within transit station areas.
5. **Increase households’ disposable income.** Housing and transportation are the first and second largest household expenses, respectively. TOD can free-up disposable income by reducing the need for more than one car and reducing driving costs, saving \$3,000 to \$4,000 per year.
6. **Reduce air pollution and energy consumption rates.** By providing safe and easy pedestrian access to transit, TOD allows households to lower rater of air pollution and energy consumption. Also, TODs can help households reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year.
7. **Conserve resource lands and open space.** Because TOD consumes less land than low-density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development.
8. **Play a role in economic development.** TOD is increasingly used as a tool to revitalize aging downtowns and declining urban neighborhoods, and to enhance tax revenues for local jurisdictions.
9. **Contribute to more affordable housing.** TOD can add to the supply of affordable housing. It was recently estimated that housing costs for land and structures can be significantly reduced through more compact growth patterns.
10. **Decrease local infrastructure costs.** TOD can reduce the costs for water, sewage, and road to local governments and property owners by up to 25 percent.

Source: Research Results Digest Number 52, Transit-Oriented Development and Joint Development in the United States: A Literature Review. Page 28. October 2002.

Some research has shown that higher density urban neighborhoods have higher rates of crime and poverty than lower density suburban areas. According to the Victoria Transport Policy Institute:

“Although studies find an association between crowding (density measured in residents per residential room, an indication of poverty) and social problems, there is no such association with density measured in residents per acre (1000 Friends of Oregon, 1999). This suggests that the association between density and social problems reflects the tendency of distressed households to concentrate in higher-density, urban neighborhoods, not that higher-density development causes social problems. This indicates that increasing middle-class housing density does not increase social problems, and urban infill could reduce such problems if distressed households become less segregated.”

5. URBAN DESIGN ELEMENTS

Urban design elements provide the basis of TOD. Many of the design elements of TOD are embodied in the ideas of new urbanism by urban designers like Peter Calthorpe. In his classic book, *The Next American Metropolis: Ecology, Community and the American Dream*, he summarizes the principles of TOD:

- organize growth on a regional level to be compact and transit-supportive;
- place commercial, housing, jobs, parks and civic uses within walking distance of transit stops;
- create pedestrian-friendly street networks which directly connect local destinations;
- provide a mix of housing types, densities, and costs;
- preserve sensitive habitat, riparian zones, and high quality open space;
- make public spaces the focus of building orientation and neighborhood activity; and
- encourage infill and redevelopment along transit corridors within existing neighborhoods.

Although Calthorpe’s concept of TOD rests upon regional controls of growth and transit services, several of his principles do have relevance to more mainstream (and modernized) concepts of TOD. According to the Victoria Transport Policy Institute, “best practices for TOD include:

- integrate transit and land use planning
- provide high quality pedestrian and cycling facilities based on universal design
- manage parking to minimize the amount of land devoted to car parks around stations
- encourage carsharing to reduce the need to own automobiles
- create complete communities, with shops, schools and other services within convenient walking distances within the TOD neighborhoods
- structure property taxes, development fees and utility rates to reflect the lower public service costs of clustered, infill development (2002)”.

The California Department of Transportation sponsored *Statewide Transit-Oriented Development Study* includes a helpful TOD Evaluation Checklist for use by local jurisdictions, transit agencies and developers in evaluating whether a project or plan conforms to TOD criteria. As the *Study* notes:

“For development to be transit-oriented, generally it needs to be shaped by transit in terms of parking, density, and/or building orientation in comparison to more

conventional development. It is not enough that it is adjacent to transit. Local governments play a significant role in promoting TOD through plans, policies, zoning provisions, and incentives for supporting densities, designs, and mix of land uses. A successful TOD will reinforce the community and the transit system. This checklist is intended to guide communities in reviewing proposed projects and in assessing the transit-friendliness of current land use codes and ordinances” (Caltrans 2002, pp. 20).

The TOD evaluation checklist is presented as Table 2 on the next page. Urban design elements that are important in TOD are discussed in more detail below.

5.1 Integrate Transit and Land Use Planning; Mixture of Land Uses

This vital element of TOD is in response to the often “haphazard development, uninspiring streetscapes, and poor connections between residential neighborhoods and transit corridors” (TCRP 2002, 75). Although the concept of integrating transit and land use planning is not new to urban designers and planning professionals, it has been difficult to institutionalize the integration of the two disciplines in most areas of the country (Valley Metro 2002).

Perhaps the most important design elements of TOD are density and mixture of land uses. Density must be sufficient to support the investment of transit, and the mixture of land uses should have people in proximity to the daily services they need. For example, a daycare center near a transit station can encourage working parents to use transit to reach employment – assuming that their employment is also accessible by transit. Integrating transit and land use planning can assure that these issues are considered as both transportation facilities and land use develop over time. Appropriate mixtures of land use encourage more transit patronage since the ability to reach a variety of destinations with transit is increased. Mixed uses can make shared parking options more attractive. In addition, balanced and mixed land uses along transit lines, especially rail lines, can help support bi-directional flows in off-peak travel hours (TCRP 2002).

The appropriate mix of land of land uses, and their relative size, are somewhat subjective and need to respond to “neighborhood objectives, market realities and existing development patterns” (TCRP 2002, 82). Peter Calthorpe (1993) suggested that at a minimum, a commercial core area should comprise 10 percent of a TOD site with at least 10,000 square feet of retail space adjacent to the transit stop.” According to Calthorpe, the size and mix of uses in each commercial core would vary depending on its size, local and regional function. However, all commercial core areas should provide convenience shopping for TOD residents and employees and nearby “secondary area” residents and employees.

Table 2: TOD Evaluation Checklist

A recent study, *Factors for Success in California's Transit-Oriented Development*, commissioned by the California Department of Transportation, provides a checklist for use by local communities, transit agencies and developers to determine if a project or plan conforms to TOD criteria.

Within an easy walk of a major transit stop ($\frac{1}{4}$ to $\frac{1}{2}$ mile), consider the following:

Land Use

- ☐ Are key sites designated for “transit-friendly” uses and densities? (walkable, mixed-use, not dominated by activities with significant automobile use)
- ☐ Are “transit-friendly” land uses permitted outright, not requiring special approval?
- ☐ Are higher densities allowed near transit?
- ☐ Are multiple compatible uses permitted within buildings near transit?
- ☐ Is a mix of uses generating pedestrian traffic concentrated within walking distance of transit?
- ☐ Are auto-oriented uses discouraged or prohibited near transit?

Site Design

- ☐ Are buildings and primary entrances sited to be easily accessible from the street?
- ☐ Do the designs of areas and buildings allow direct pedestrian movements between transit, mixed land uses, and surrounding areas?
- ☐ Does the site's design allow for the intensification of densities over time?
- ☐ Are the first floor uses “active” and pedestrian oriented?
- ☐ Are amenities provided to help create a pedestrian environment along and between buildings?
- ☐ Are there sidewalks along the site frontage? Do they connect to sidewalks and streets on adjacent and nearby properties?
- ☐ Are there trees sheltering streets and sidewalks? Pedestrian-scale lighting?

Street Patterns and Parking

- ☐ Are parking requirements reduced in close proximity to transit, compared to the norm?
- ☐ Is structured parking encouraged rather than surface lots in higher-density areas?
- ☐ Is most of the parking located to the side or to the rear of the buildings?
- ☐ Are street patterns based on a grid/interconnected system that simplifies access?
- ☐ Are pedestrian routes buffered from fast-moving traffic and expanses of parking?
- ☐ Are there convenient crosswalks to other uses on-and off-site?
- ☐ Can residents and employees safely walk or bicycle to a store, post office, park, café or bank?
- ☐ Does the site's street pattern connect with streets in adjacent developments?

Source: California Department of Transportation. Statewide Transit-Oriented Development Study. Final Report. September, 2002. Pages 20 and 21.

Density around transit stations helps to “shorten trips by bringing activities closer together; encouraging more non-motorized (walk and bike) travel; increase vehicle occupancy levels of motorized trips by encouraged transit usage and ride-sharing (TCRP 2002, pp. 80)”. These three factors most influence Vehicle Miles Traveled, or VMT, and help to shift VMT to modes other than the single occupant vehicle. According to a literature review done by the TCRP (2002), densities vary according to the type of transit service provided:

- seven units per gross acre for basic bus service;
- 15 units per gross acre for premium bus service; and
- 20 to 30 units per gross acre for rail service.

However, residential density is only one factor that affects transit ridership to consider, and appropriate densities will vary between locations. It is possible for higher employment densities to offset the residential densities typically needed, and stations that provide parking can offset the density required to maintain healthy riderhip levels. (TCRP 2002).

5.2 Does the MAG Region Have Sufficient Density to Support Transit?

Transportation professionals have heard from citizens and other planning professionals that the MAG region does not have sufficient density to support transit service. In the early stages of planning work for the MAG High Capacity Transit Plan, the consultant conducted a peer review of transit systems in North America with successful light rail, bus rapid transit and commuter rail transit systems. A general review of six transit systems for each transit mode was done, with three of these systems being analyzed in more detail. The systems analyzed in the peer comparison include those listed below. Systems with detailed analysis are italicized.

- Commuter Rail: *Los Angeles Metrolink (Inland Empire to Orange County Line); San Diego Coaster; San Jose Altamont Commuter Express; Dallas Trinity Railway Express; Chicago Northern Indiana Commuter Transportation District South Shore Line; and Toronto Go Transit Lakeshore East Line.*
- Light Rail: *Los Angeles Metropolitan Transportation Authority Green Line; San Diego Trolley Blue Line (Santa Fe Depot to Mission Valley); Dallas Area Rapid Transit (DART) Blue and Red Lines; Denver Regional Transportation District (RTD) Central and Southwest Lines; Santa Clara Valley Transit Authority San Jose, St. Louis Metrolink.*
- Bus Rapid Transit: *Los Angeles MTA Rapid Bus Wilshire/Whittier Line; Miami South Miami-Dade Busway; Vancouver Richmond to Vancouver 98B Line; Pittsburgh South, East & West Busways; Ottawa Transitway; and Washington DC Dulles Corridor.*

The general peer group review collected various operations data, such as line length, number of stations, riders, service frequency and operating and capital costs. The detailed peer group review placed more emphasis on demographic characteristics of the corridor and region to determine whether the future growth was sufficient to warrant high capacity transit service in a number of corridors throughout the region. Efforts were made to select systems with corridor lengths and development patterns similar to possible corridors in the MAG region. For the peer

systems with detailed analysis, population, employment, and income data was collected for areas within five miles of each transit route. Detailed comparisons are available in Working Paper Two of the MAG High Capacity Transit Plan (www.mag.maricopa.gov). Patterns emerging from the peer group comparisons in the detailed data review include:

- Commuter rail systems selected in the peer group review are capable of maintaining successful operations in corridors with lower population and employment densities than what is present in light rail (LRT) and bus rapid transit (BRT) corridors.
- Each LRT or BRT system serves a minimum of one employment center (greater than 50 employees per acre) while two of the selected commuter rail systems serve corridors with more dispersed employment centers and no census tracts with greater than 50 employees per acre.
- All but one system operates within a metropolitan area with over 50 percent of the region's freeway lane miles extremely or severely congested as determined by the Texas Transportation Institute, a nationally-known research organization which produces reports on automobile congestion each year. The only metropolitan region with a percentage below one-half was the Dallas region with 48 percent of the region's freeway lane miles congested.
- Average trip lengths for commuter rail systems are a minimum of 25 miles. These averages are at least four and as many as nine times as long as the average trip lengths for light rail. Information collected about the Los Angeles Rapid Bus service suggests that average trip lengths on BRT systems are similar to those on light rail systems.

In addition, the following minimum values were observed in the corridors studied for each of the three transit technologies, as shown in the table below:

	Commuter Rail	Light Rail	Bus Rapid Transit
Population Density (persons per square mile)	3,000	3,000	3,000
Employment Density (persons per square mile)	1,000	2,500	2,000
Average Trip Length (miles)	25	5	7
Daily Vehicle Trips on Parallel Corridors (per day)	100,000	75,000	41,000

The data collected from the peer systems was compared with future population and employment characteristics of potential transit corridors in the MAG region. Overall, the future scenario included a population of approximately 6.39 million – an approximate doubling of the 2001 regional population of 3.17 million. The future scenario assumed build-out of the regional freeway system and city general plans. Potential corridors were selected based on a review of major past transit studies, stakeholder interviews of member agencies and other interested groups, and other linear corridors with a high degree of self-containment of trip origins and

destinations. It was anticipated that the peer review analysis would help to limit the number of corridors identified as potentially viable for high capacity transit.

However, the analysis showed that *all of the corridors identified had the ability to support transit when compared with population thresholds created by the detailed data review of peer transit systems*. While the ability to implement a comprehensive light rail/bus rapid transit and commuter rail system remains dependent on the decisions of public policy makers and funding constraints, the analysis done as part of the High Capacity Transit Plan shows that the MAG region will indeed have sufficient population density in the corridors identified to support high capacity transit service. (MAG 2002).

5.3 Pedestrian and Bicycling Facilities

Pedestrian and bicycling facilities that encourage walking and bicycling are an important urban design element of TOD, since all transit trips include some element of either walking or bicycling. Ideally, the pedestrian and bicycle networks near TODs link with an overall regional system of pathways so that transit can assist bicyclists and pedestrians in expanding their travel networks. According to Peter Calthorpe (1993): “A coordinated system of bikeways should be provided in conjunction with TODs or a series of TODs. Important destinations, such as core commercial areas, transit stops, employment centers, parks, open spaces, schools, and other community facilities should be linked by these bike routes” (p. 102).

The MAG region has already done extensive work on identifying strategies to improve the quality of the pedestrian environment (see Implementation section, below). The TCRP recently published a literature review (2002) that summarizes several principles for achieving pedestrian-friendly designs in TODs. These principles are listed in Table 3 on the following page.

Table 3: Pedestrian-Friendly Design Principles

Create *pedestrian friendly streets* that will primarily serve foot traffic and encourage bicycle travel (Puget Sound Regional Council 1999).

Orient buildings to the street with set backs of no more than 25 feet (Ewing 1999A). Buildings placed close to a street minimize walking distances between destinations and also provides visual enclosure, an important element in creating a comfortable outdoor environment. Though there is some disagreement between urban designers, Ewing (1997) suggest a ratio of building height to right-of-way and set-back width of 1:3. This translates to 20-foot high store fronts on 60-foot wide lots.

Set minimum floor-area ratios (FARs) for retail and commercial uses to create a lively streetscape and minimize dead spaces created by parking lots. Calthorpe (1993) suggests a minimum FAR of 0.35, while the Puget Sound Regional Council (1999) suggests a target of 0.5 to 1.0 for developments without structured parking and at least 2.0 for developments with structured parking.

Use ***grid-like street patterns*** that allow many origins and destinations to be connected by foot; avoid cul-de-sacs, serpentine streets, and other curvilinear alignments that create circuitous walks and force buses to meander or retrace their paths (Bernick and Cervero 1997).

Use ***traffic-calming measures*** such as narrow streets, on-street parking, vertical realignments (e.g., street tables), horizontal realignments (e.g., chicanes), and street trees (Ewing 1999A; Puget Sound Regional Council 1999). Ewing (1999A) contends that street trees spaced 30 feet apart provide an added benefit of creating visual enclosure.

Shorten trips through good site planning, using short blocks and straight streets, minimal building setbacks, and pedestrian shortcuts. To encourage walking, block lengths of 300 feet are suggested since smaller block faces allow for high levels of pedestrian connectivity (Ewing 1997).

Provide a ***continuous network of sidewalks wide enough to accommodate anticipated levels of pedestrian traffic*** (Ewing, 1997). Sidewalks should be located along or visible from all streets and allow comfortable, direct access to core commercial areas and transit stops (Puget Sound Regional Council 1999).

Ensure ***safe, convenient, and frequent street crossings***. Signalized crossings, bulb-outs, and mid-block crossings are recommended (Puget Sound Regional Council 1997). Ewing (199A) notes that smaller corner radii shorten crossing distances, induce motorists to slow down at corners, and discourage rolling stops. Bus drivers, however, counter that tight turning geometries hamper bus movements.

Use landscaping, weather protection, public art, street furniture, lighting, public phones, and other provisions in public spaces. Likewise, require all developments to provide for pedestrian and cyclist needs, such as benches, continuous awnings, bicycle racks and street trees (Puget Sound Regional Council 1999).

Source: Research Results Digest Number 52, Transit-Oriented Development and Joint Development in the United States: A Literature Review. Pages 84 - 86. October 2002.

5.4 Parking

Many jurisdictions will use some type of parking management strategy in TODs to make efficient use of parking resources, and to encourage people to use transit services.² Providing unrestricted parking at transit stations typically does not support many of the other features of TOD. For example, using large amounts of land for parking prevents use of these areas for other potentially interesting and productive uses, such as commercial or retail areas that support transit use. Parking lots create an automobile-oriented environment rather than the pedestrian-oriented environment necessary for TOD. Limiting access to inexpensive parking is a common strategy municipalities use to encourage people to use transit. Other strategies for parking management are provided in Table 4 (Caltrans 2002; Victoria Transportation Policy Institute 2002).

It should be noted that, especially in developing rail systems, such as the Central Phoenix/East Valley Light Rail Transit System, extensive parking is typically provided at transit stops to help maximize transit ridership. Parking is especially needed at terminal stations that draw customers from a larger travel catchment area. While providing parking at stations can help offset the density required to maintain ridership, “an oversupply of park-and-ride lots at transit stations, however, can undermine regional land-use benefits” (TCRP 2002, p. 81).

Some transit agencies do not allow vast amounts of parking at transit stations, except at end-of-the-line stations – especially in areas where TOD is being encouraged. However, a more common approach is to use park-and-ride lots for commuters as a way to preserve land for future development. The idea is that parking lots can be converted to infill sites if local land use policies and market conditions are supportive of such a change. (Caltrans 2002; TCRP 2002).

“In theory, as the TOD development market matures, the surface parking lots can be “harvested” as land for TODs. In reality, however, the theory has rarely worked due to the difficulty of taking parking back from existing park-and-ride patrons (who often view the parking as their vested right). Indeed, the collective voice of existing park-and-ride patrons is always louder than the voice of future residents (Caltrans 2002, 67).”

5.5 Prominent Public Spaces

This element of TOD relies on the concepts of “new urbanism” which are traditional community design and town planning principles. In Europe, for example, transit stations are more than collection and drop-off points; they are places for the community to gather with a major focus such as a civic plaza or open-air market (TCRP, 2002). Peter Calthorpe (1993) asserts that each TOD needs “village greens and transit plazas... to create a prominent civic component to core commercial areas (92).” Calthorpe also asserts that parks and community buildings, such as schools and libraries, help reinforce a sense of community identity and place that is tragically missing from modern American society. “The re-integration of our civic and commercial world is essential to building strong communities” (93).

² TDM is a commonly accepted acronym for Traffic Demand Management. It refers to using various techniques to manage the demand for roadway space.

Table 4: Parking Management Strategies and Travel Reductions

Parking Management Strategy	Description	Parking Demand Reduction
Shared Parking	Share parking facilities among a group of users rather than assigning each an individual space. Greater reductions are possible with mixed land uses, since different activities have different peak demand times.	15 - 40%
More Accurate Requirements	Reduce minimum parking requirements at sites with lower parking demand.	10 - 30%
Trade-off with TDM Strategies	Reduce parking requirements at facilities with TDM programs.	10 - 30%
Parking Pricing	Charge motorists for using parking facilities using cost recovery prices.	10 - 30%
Favor Short-term Use	Avoid discounts for long-term leases.	Varies
Cashing Out	Provide the cash equivalent of free parking to commuters who use alternative modes.	10 - 30%
Unbundle Parking	Rent and sell parking facilities separately, rather than automatically included with housing and commercial leases and purchases.	Varies
Location Efficient Development and Mortgages	Design and manage development at more accessible locations to encourage use of alternative modes.	20 - 50 %
Address Spillover Problems	Use management, pricing and enforcement strategies to address spillover problems.	Varies
Develop Overflow Parking Plans	Use overflow parking plans, rather than excessive supply, to address occasional events.	Varies
Regulate Use of Parking Facilities	Use regulations to encourage more efficient use of existing parking supply.	Varies
Parking Maximums	Limit maximum parking supply in an area.	Varies
In Lieu Fees	Use developer fees to fund public parking instead of requiring individual facilities to provide off-street parking.	Varies
Tax Parking	Impose taxes on parking facilities and their use.	Varies
Parking Facility Design	Design parking facilities to address various problems.	Varies

Source: Online TDM Encyclopedia – Parking Management. Victoria Transport Policy Institute. www.vtpi.org/tdm/tdm28.htm.
Updated November 5, 2002..

Integrating public spaces with TODs, and placing them as close to transit stops as possible can create more prominent open spaces.

“The architectural quality of community buildings can elevate their prominence and civic importance. Major building entrances should face public streets and be strongly articulated. Massing and architectural features should be designed to take advantage of vistas along streets to visually connect these civic plazas with their surrounding neighborhood. Major public buildings should have a civic presence enhanced by their height, mass and materials. The architecture should convey a sense of permanence and importance (Calthorpe 1993, 93).”

6. SUCCESSFUL EXAMPLES

There are many examples of successful TOD projects and programs in many western United States cities. Some of these more relevant projects and programs are highlighted below.

6.1 King County Department of Transportation – Seattle, Washington

King County has been working on bus-related TOD projects since 1998, including projects in Renton and Seattle. According to the project Web site (www.metrokc.gov/kcdot/alts/tod),

“Another project is under way in Redmond, and the county is investigating TOD feasibility in Burien, Kenmore, Kent, Kirkland, Shoreline and unincorporated King County . . . The mix of uses in King County's TOD projects includes transit centers, park-and-ride lots, off-street bus-layover facilities, and residential, institutional, retail, office, hotel and entertainment uses. Project concepts range from 308 apartments above a park-and-ride lot in Redmond (near Microsoft world headquarters) to four skyscrapers above an underground bus-layover facility in downtown Seattle near the state Convention & Trade Center.”

6.2 Regional Transportation District – Denver, Colorado

The Regional Transportation District (RTD) opened its first rail line in 1994 and another in July 2000. TOD in Denver increases transit ridership. RTD works with cities and developers to transform parking areas around stations to TOD. According to the RTD Web site (www.rtd-denver.com), there are several model TOD projects:

“The granddaddy of all "transit villages" is the 16th Street Mall in Downtown Denver. The free MallRide bus service opened in 1982 and has been a transformation force in bringing a mix of housing, office, shopping, and entertainment to the Central Business District.

Since RTD opened the first Light Rail line in 1994, several projects have emerged. CityCenter Englewood, replacing Cinderella City, is perhaps the largest and most comprehensive, but exciting developments along Welton Street in Five Points also benefit from Light Rail. The C Line in the Central Platte Valley

anchors an increasing number of entertainment venues in lower Downtown Denver. The commercial and residential development around Union Station: Lower Downtown (LoDo)/Coors Field/16th Street Mall is another growing example of TOD with a 24-acre Riverfront project that includes retail, office and 1800 residential units.”

The RTD Web site also includes typical elements of TOD, and the importance of other partners, including cities and developers, in creating successful TOD projects.

6.3 San Diego Metropolitan Transit Development Board

According to a fact sheet on the San Diego Metropolitan Transit Development Board Web site (www.sdcommute.com) regarding TOD, local and regional agencies have adopted policies to encourage TOD plans at more than 15 light rail stations. The projects provide mixed-use development and are typically private-public partnerships. For example, the America Plaza Transfer Station is a 34-story development site completed in 1992. A light rail station is incorporated into a street-level atrium that includes shops, restaurants, outdoor plazas and the San Diego Museum of Contemporary Art. The station also connects with 20 local bus routes and boasts 6,500 transit boardings daily. Information on other successful TOD projects is available on the organization’s Web site.

7. IMPLEMENTATION

TOD can be implemented in a variety of settings, from new neighborhoods designed around public transit stations, to incremental changes in existing neighborhoods where transit has been improved or recently introduced. TOD is typically implemented by local and regional governments with the assistance of private developers and businesses. This type of development is appropriate in areas where adequate transit service exists. (Victoria Transport Policy Institute 2002). Even though the basic principles of TOD contribute to meeting many public policy goals and is a generally favorably received concept, “to date, America’s track record at implementing successful TODs has not been impressive.” (TCRP 2002, p. 2). A basic understanding of the challenges to creating successful TOD, and potential solutions, can provide guidance to MAG member agencies on implementing successful TOD projects. These are described below.

7.1 Challenges to Creating Transit Oriented Development

A recent publication of the Transit Cooperative Research Program (TCRP) explains that constraints to implementing TOD can be categorized as fiscal, organizational and political. Fiscal constraints are factors that might limit the financial feasibility of TOD projects, such as inaccurate or unrealistic market assessments, or inability to obtain financing. Organizational constraints are structural issues that prevent building partnership between transit agencies and other governmental agencies responsible for project implementation. Political constraints include inappropriate land use policies and neighborhood resistance to additional commercial development or density increases.

7.1.1 Fiscal Constraints. The cost of providing adequate transit service in all areas of the MAG region poses a significant obstacle to TOD. Many cities have had to obtain funding on their own because prior efforts to secure regional funding for transit service at the ballot box have not been successful in the MAG region. The cities of Glendale, Phoenix and Tempe have local sales taxes dedicated to the provision of transportation services. A significant portion of these funds support transit operational expenses. Other cities in the MAG region have insufficient transit service to meet basic needs because they are not able to obtain local funding sources dedicated to providing transit service.

In addition, the high cost of providing supporting infrastructure, such as bicycle and pedestrian facilities (sidewalks, bicycle lanes, shading and rest areas), expanded sewer and water capacity and signalization upgrades can pose implementation barriers as there is competition for dollars to implement projects. (The high cost of retrofitting means that incorporating bicycle and pedestrian travel issues into every transportation project is more cost-effective and fiscally responsible in the long-term.) The relative “newness” of TOD concepts makes their economic viability questionable, which makes securing traditional loans to construct TOD projects challenging. When funding for transit is constrained, as in the MAG region, neighborhood enhancements around transit stations take a lower priority when compared to funding a basic level of transit service. Finally, construction costs and development fees can be higher with denser housing and commercial projects in infill areas. (TCRP 2002.)

7.1.2 Organizational Constraints. Organizational constraints can arise if organizations responsible for transportation have different goals and policies, and different decision-making structures. TOD coordination becomes more complex when many government and business entities are required to work together to develop new approaches to traditional issues. Successful projects often require paradigm shifts away from the traditional ways of doing business. “Struggles over turf and resistance to change within public agencies are legendary and present major obstacles to effective project implementation” (TCRP 2002, 73).

7.1.3 Political Constraints. Residents may perceive infill TOD projects that provide a mixture of land uses, such as additional housing and offices, as having negative impact on the community, including increased congestion, additional stress on crowded schools, and crowding at neighborhood stores. Some residents may be fearful that affordable housing projects will change the character of a community and negatively affect its image, or decrease property values. Neighborhood opposition has stopped many infill mixed-use developments throughout the country, in places such as Oakland, Miami, Atlanta and many other areas (TCRP 2002).

TOD often requires changes in zoning codes and development policies to allow a mixture of land uses and an increase in density, as well as a reduction in parking requirements around transit stations. Existing policies may contain exclusionary zoning, restrictions on lot size, and inappropriate setback, height or parking standards that limit TOD opportunities (Victoria Transport Policy Institute 2002).

Finally, political issues can also become an issue between different transit user groups. For example, commuters from outlying suburban areas typically want extensive parking surrounding rail stations, which discourages nearby high-density development and walk-access to transit.

“Efforts to reduce parking supplies invariably incites vocal protests, especially in built-up settings where curbside parking is in short supply” (TCRP 2002, 73).

7.2 Overcoming the Implementation Barriers

While there are a number of implementation barriers, experiences of successful systems show that collaboration is key. There are many partners to include in creating a successful TOD, including developers, financial lending institutions, cities and towns, regional planning agencies, transit agencies and public interest groups. The formation of public-private partnerships has been a key component of success in many TOD projects. (TCRP 2002)

“Collaboration, most sides agree, is the best antidote to TOD barriers. Collaboration is essential simply because everyone is dependent on the actions of others in making transit-supportive investments a reality. Banks must be willing to provide loans to real estate developers who want to bring about TOD. Local governments might need to follow with permissive zoning that allows higher densities and fewer parking spaces than the norm, which in some instances might require state legislation. Transit agencies might in turn need to realign bus routes to better serve a planned TOD. Or they might have to sell excess station-area land purchased with federal grants and thereby subject to federal control. And local residents have to be convinced that, on balance, a TOD will improve, rather than detract from, existing neighborhood conditions (TCRP 2002, 11).

7.2.1 Fiscal Constraints. Unfortunately, there is no easy solution to the financial obstacles of providing adequate transit service and supporting infrastructure to create TODs (bicycle and pedestrian networks and facilities, expanded sewer and water capacity, signalization upgrades). Often, demand for these services must be presented to elected officials if they are to become an investment and budgeting priority.

Securing traditional loans can be challenging for TODs if they are new to an area. The risk of building projects near rail stations in suburban areas, with higher densities and different urban design features, are substantial. There are a number of financial incentives that can be made available by government and public institutions, such as:

- grants
- sliding-scale impact fees
- tax abatement
- creative financing
- direct public-sector financial participation
- benefit assessment districts
- enterprise zones
- tax increment financing (not available in Arizona)
- loans

Securing traditional loans for untried development can be challenging for developers. While financial institutions have a role to play in providing new and alternative funding options, the public sector can play a role in overcoming some of the financial barriers that make TODs more costly as well. For example, local government agencies can assist with site assembly, low-cost financing through tax-exempt financing, loan guarantees or federal grants, expediting the permitting process, and by providing infrastructure. Assistance with land assembly is especially important in infill areas where it is common to have many small parcels owned by different

people. These parcels can be too small to build a project on due to restrictions in zoning ordinances or in building codes. Consolidation of parcels like these would be very beneficial. Tax relief is one method of enticing developers to locate near transit stations. The problem for Arizona is that our State enabling legislation does not allow that. Mixing funding sources by using both private and federal grants is a way to spread financial risk and increase the ability of a private lender to obtain funding. Local governments also have the option of providing supporting infrastructure, such as bicycle and pedestrian facilities (sidewalks, bicycle lanes, shading and rest areas), expanded sewer and water capacity, and signalization upgrades (TCRP 2002).

Sometimes TOD development is a low priority when funding is constrained. Indeed, funding for transportation, like many public services, has always been constrained. Professionals throughout the country are realizing that creating TOD increases access to, and use of, existing transit services, which results in successful transit systems. While some transit operating agencies have chosen to proactively influence land markets surrounding transit stations, others have chosen to facilitate and coordinate TOD between interested parties. Regardless of the level of advocacy, areas with successful TOD projects recognize that creating markets to fill buses and trains helps to maximize public investment in transit (TCRP 2002).

7.2.2 Organizational Constraints. The best way to overcome organizational constraints is through collaboration. When different organizations have different decision-making structures and different organizational goals and objectives, the people involved in the TOD process must work together to find shared goals that work for all partners involved. Patience, communication and a visionary outlook all assist in this time-consuming effort – there are typically no “shortcuts” to building trust between organizations that may not have worked together in the past.

7.2.3 Political Constraints. Community outreach is an essential component of any TOD project to help identify and resolve political issues. Neighborhoods must be convinced that a TOD project will positively impact their community. Regional and local levels of government, as well as transit agencies, need to be involved in a public education and outreach program using a variety of public involvement techniques, such as community meetings, public workshops and media communication. Obtaining and responding to public input helps build trust. Relationships between transit agencies and developers create development partnerships. “Solidifying community support can also be a critical element to help move local governments with land-use control to plan and zone for transit-supportive development” (TCRP 2002, 13).

Zoning and other development policies and regulations, overseen by local governments, influence the type and character of most development, including the development surrounding transit stations. Existing policies may contain exclusionary zoning, restrictions on lot size, and inappropriate setback, height or parking standards that limit TOD opportunities. There are a number of regulations, such as zoning, planned unit development classifications, specific-plan initiatives, and transfer of development rights programs that have been used successfully in other areas of the county. (TCRP 2002)

According to a Literature Review done by the TCRP,

“Among the zoning initiatives used to promote TOD have been incentive zoning (e.g., density bonuses), performance zoning (e.g., tying incentives to meeting minimum criteria), inclusionary zoning (to encourage mixed uses), interim zoning (to prevent auto-oriented uses from precluding eventual TOD), floating zones (to allow flexibility in where desired uses go), and minimum-density (as-of-right) classifications. (TCRP 2002)”

Planned Unit Development (PUD) is another public policy that can be used to support TOD. PUD is often used as a tool to control design and land uses at the tract level on large master planned developments that are typically auto oriented. However, as long as the PUD ordinance contains elements that support the land use mixture and intensity of TOD and appropriate site designs, such as creating a pedestrian orientation, PUD can provide an effective way to create TOD. In San Jose, California, PUD designations have been used to shape the location and design of light rail stations (TCRP 2002).

Specific Plans can also be used to create TOD, since they allow local governments to create more detailed specifications for how an area might develop. Transfer of Development Rights is a tool that is rarely used in the United States to create TOD and is more common in Canada. Under this concept, landowners can shift development to station areas that have room for additional density (receptors) while other areas of the region remain at lower densities (senders) (TCRP 2002).

7.3 Resources for MAG Member Agencies

Although the term “transit oriented development” may be new to the MAG region, several of the underlying concepts, especially in the area of encouraging pedestrian use, are not new. The MAG region has already developed several resources to assist member agencies in determining the appropriateness of TOD, and its underlying concepts, for different locations in the Region.

7.3.1 MAG Pedestrian Area Policies and Design Guidelines. MAG is a leader in promoting improvement in the Region’s streetside environments to better accommodate and encourage pedestrian travel. Past pedestrian planning efforts conducted by MAG, with the support of its member agencies, have led to a variety of pedestrian-oriented policies, programs and roadway improvements. Prominent among these are the *1993 Pedestrian Plan*, the creation of the MAG Pedestrian Working Group, a region-wide household travel survey, the publication of the *1995 Pedestrian Area Policies and Design Guidelines*, the Walking and Bicycling into the 21st Century Conference Series, and the Pedestrian Design Assistance Program. In addition, the *Pedestrian Plan 2000* outlines programs and actions to promote better pedestrian accommodation in the regional transportation system.

In 1994, MAG formed the Pedestrian Working Group to promote increased awareness of walking as an alternative mode of travel and to improve facilities for people who walk. The Working Group consists of appointed staff from MAG member agencies and representatives from the development and planning community. One of the group’s key accomplishments most

related to TOD was the creation of the *Pedestrian Area Policies and Design Guidelines* in 1995. The *Guidelines* identify types of pedestrian areas commonly found in the MAG region, and proposes policies and design elements to promote walking. A pedestrian area is defined as any area where a concentration of pedestrians or vehicles is likely, or desired. Twelve varieties of pedestrian areas are described. The twelve areas represent four physical types of land uses (origins and destinations), contrasted to three levels representing a range of qualitative characteristics. Levels refer to a range of qualitative pedestrian area characteristics, including pedestrian intensities and the relationship of pedestrians to other roadway users, especially the automobile. Levels are classified into Level 1, 2 or 3, where 1 is the lowest intensity and 3 is the highest intensity of pedestrian use. Types of areas are based on the mix of land uses and development densities adjacent to the pedestrian areas, expressed as Neighborhood (least variety of land use/less dense development), Community, Campus, and District (most variety/most dense).

The *Guidelines* provide a basic understanding of pedestrian needs and recommendations for overall changes to better accommodate pedestrians in the MAG region. The General Policies and Design Guidelines apply to all pedestrian areas. General policies support the establishment and creation of pedestrian areas, and general guidelines identify types of physical improvements necessary for the creation of safer, more secure, and pleasant pedestrian areas. General policies and design guidelines address the areas of security, planning, priority of implementation, community participation, and pedestrian education. Furthermore, each level, each of the four area types, has basic design guidelines and policies that contribute to its success as a pedestrian area. These design guidelines provide specific guidance in the following areas:

- Walkway Width
- Walkway Separation from Traffic Intersections
- Adjacent Roadway Width and Traffic Calming Techniques
- Signs
- Bicycle Access
- Walkway Character
- Walkway Furnishings
- Walkway Shade
- Parking
- Lighting
- Transit Access

The MAG *Pedestrian Area Policies and Design Guidelines* is a comprehensive manual of pedestrian policies and facility design that creates a regional standard for use by community groups, planners and design professionals alike. The book won the Arizona Planning Association's best ordinance award in 1996 and is requested by planners nationwide.

7.3.2 Valley Metro Pedestrian-oriented Design (PeD) Standards and Design Guidelines.

In anticipation of the Valley's first segment of a regional light rail transit system, Valley Metro sponsored development of the *PeD Standards and Design Guidelines*. The *PeD Guidelines* were established to "... assist elected and appointed planning officials, members of planning and zoning boards, technical planning staff, transit agency staff, community representatives, developers, property owners, architects and interested citizens who wish to improve the condition of the pedestrian realm and promote walking as a viable transportation alternative in the Valley Region (Valley Metro 2002, 1)."

Providing evidence of locally supportive policies to transit investments is a step in securing funding from the federal government for light rail transit investments. When developing the guidelines, which began as TOD guidelines, many Valley cities expressed concerns about the relevance of TOD guidelines, given that transit services were planned far into the future. In spite of these concerns, most cities in the region understand that the basic elements of TOD – mixed land use, prominent public spaces, and improved bicycle and pedestrian facilities – result in an improved quality of life. (Valley Metro 2002).

Basic elements of *PeD* include a link between transportation and land use decision-making; compact, mixed use development; reduced parking; and a fine-grained interconnected street system. According to the *PeD Guidelines*, Important elements of a walkable environment include:

- sidewalk design
- access to desired uses
- climate and shade
- ease of street crossing
- directness of routes
- natural and man-made barriers
- scale
- security
- visual interest and community identity
- noise and air quality
- access for persons with disabilities

The *PeD Guidelines* include a thorough explanation of different types of street systems, and include guidelines and standards on land use types and intensity; creating and maintaining community and neighborhood identity; circulation systems; public open spaces and parks, and details on site designs.

7.3.3 Light Rail Transit; Phoenix, Arizona – Economic Development along the Planned Light-Rail Line.

This report, completed in December 2001 by the Urban Land Institute (ULI) and sponsored by the City of Phoenix and ULI Arizona, evaluated potential land uses around four stations along the Central Phoenix/East Valley Light Rail Transit Project line. The professional experts of the panel examined four main issues: market potential; planning and design; development strategies; and implementation. Their key findings from the conclusion of the document are listed below as provided in the document.

- “Some key stations will be the catalyst for TOD in the region. They include Camelback Road/Central Avenue, downtown, and the stations serving the area around the airport.
- Camelback Road/Central Avenue is the “100 percent corner” – where a big impact can be effected – and the adjacent neighborhood does not have to suffer because of it.
- There are several unique neighborhoods along the line. They should be viewed as an asset to the system (and vice versa), not as a hindrance. Station planning and design need to incorporate the uniqueness of these neighborhoods.
- Start early in the process to promote TOD in Phoenix. Do not have the “if we build it, they will come” attitude. The process for promoting the light-rail line and TOD needs to be clear and organized (ULI 2001, 39).”

The report includes a discussion of market strengths and weaknesses of each segment of the LRT project, addressing issues such as density, access, land assembly, urban design and development characteristics, parking availability and attractiveness to pedestrians. A working definition of TOD is provided along with specific station development opportunities. The report identifies public policies affecting TOD, and recommends specific transportation policies that:

- assign priority to pedestrians and transit users at transit stations;
- connect neighborhoods to streets using streets that encourage bicycle and pedestrian use;
- pursue a strategy of mixed-use development and shared parking;
- discourage excessive parking in the downtown and price municipal parking facilities to market rates; and
- integrate land use and transportation at the local and regional level.

The ULI panel encouraged continuing current land use processes such as station area planning to “demarcate neighborhood boundaries more clearly and to defend existing residential areas from intrusion by incompatible commercial uses.” Traffic calming can be used to prevent nonresident parking in neighborhoods near stations (an important issue, since the report points out that the Central Phoenix/East Valley LRT is providing less station parking than comparable new systems). The panel also supported the use of an overlay zoning district for station areas and efforts to “work with property owners and neighborhood residents in preparing station area plans, which will promote mixed-use development at densities that will generate ridership for the transit system.” Upon adoption of the station area plans, creating appropriate zoning is recommended. On a broader level, to support the LRT investment, higher-density development should be limited to station locations rather than distributing it throughout the city (ULI 2001, 20).

The report includes several other specific recommendations and policies to help improve the effectiveness of the initial segment of the LRT system support economic development. The report is available on the LRT Project Web site at www.valleyconnections.com.

7.3.4 City of Phoenix Transit Overlay District. In March 2000, the voters in the city of Phoenix approved Transit 2000, a sales tax increase to improve bus service and help fund a light rail transit system. In May 2001 the Phoenix City Council approved a work program to encourage the planning for transit-oriented development (TOD) adjacent to the planned light rail stations. TOD is a development type or style that maximizes transit ridership by encouraging supportive land uses and providing good pedestrian connections from those uses to the transit stations.

The first step in planning for transit-oriented development was the inclusion of a transit-oriented development goal within the Phoenix General Plan. That goal was adopted by City Council in November 2001 and ratified by the voters in March 2002.

The next step in the process is to approve a text amendment to zoning ordinance (TA-23-00) that contains regulations for the lands approximately one-quarter mile to 2000-feet adjacent to

proposed light rail stations, which is approximately the distance a pedestrian can walk in five to ten minutes. This new zoning district will be known as the Transit Oriented-Development Interim Overlay Zoning District (TOD). This district will ONLY apply to new development and construction. The district will prohibit or limit the development of new uses that do not support transit ridership, that is, uses that transit riders do not use. Any existing uses that would be prohibited will be deemed non-conforming uses and allowed to remain in place.

The overlay district will also require additional development standards for any new construction. These standards will require new construction to provide better connections and environment for pedestrians between the development and the sidewalk leading to transit stations. These standards will include building frontage, facade and entry regulations, as well as sidewalk, parking and loading regulations.

After the approval of the text amendment, a rezoning application will place the overlay on the Zoning Map. Once approved, the underlying zoning districts will still apply. However, the additional regulations will supersede the underlying district regulations where in conflict or not present, and some uses will be prohibited or limited. Phoenix's Interim Transit-Oriented District Overlay Zoning Ordinance is included as Appendix A to this report.

8. SUMMARY

Defining transit-oriented development can be challenging since there is no single definition; however, TOD generally refers to land uses and associated design elements that serve to maximize both access to, and use of, transit. Despite the fact that not all parts of the MAG region have an adequate level of transit service to meet the demands of a rapidly growing area, TOD is relevant – partially due to the construction of the initial segment of the Central Phoenix/East Valley Light Rail Transit project, and also due to the ability of several corridors to have sufficient projected population density to support some form of high capacity transit (such as light rail, bus rapid transit or commuter rail). Since these corridors could support transit in the future, it is fiscally responsible to be sure these corridors are developed in a way that does not preclude TOD in the future.

TOD provides numerous, safety, environmental, economic and social benefits. On the other hand, there are costs associated with providing adequate levels of transit and the associated community infrastructure necessary to create a TOD environment. Common design elements of TOD include integrating transit and land use planning to provide a range and mixture of land uses, providing high quality bicycling and pedestrian areas that incorporate universal design principles, parking management and car sharing programs, and development and taxation policies that support TOD.

There are many examples of successful TOD projects and programs in the Western United States in areas such as: Seattle, Washington; Denver, Colorado; and San Diego, California. These areas have all been able to overcome the fiscal, organizational and political constraints associated with TOD implementation. Overcoming implementation barriers is possible with collaboration and the creation of public-private partnerships. Three main resources for MAG member agencies in implementing appropriate levels of TOD are the MAG Pedestrian Area Policies and Design Guidelines, the Valley Metro Pedestrian-oriented (PeD) Standards and Design Guidelines, and a recently completed report by the Urban Land Institute entitled “Light-rail Transit. Phoenix, Arizona. Economic Development along the Planned Light-rail Line.”

Appendix A

Interim Transit-Oriented District Overlay Zoning Ordinance- TWO (TOD-2)

1. *Purpose and Intent*

The purpose of the Transit-Oriented District TWO (TOD-2) is to encourage an appropriate mixture and density of activity around transit stations to increase ridership along the Central Phoenix/East Valley CP/EV light rail corridor and promote alternative modes of transportation to the automobile. The secondary intent is to decrease auto-dependency, and mitigate the effects of congestion and pollution. These regulations seek to achieve this by providing a pedestrian-, bicycle-, and transit-supportive environment developMENT INTEGRATING AUTO USES with a complementary mix of land uses, where streets have a high level of connectivity and the blocks are small, all within a comfortable walking and bicycling distance from light rail stations.

Transit-Oriented Development often occurs as infill and reuse within areas of existing development. The regulations within this ordinance vary in some cases from other ordinances, such as the Urban Residential (UR) District, related to infill development in the City, because of the additional need to support transit ridership. The Transit-Oriented District prohibits uses that do not support transit ridership.

The specific objectives of this district are to:

- ❖ Encourage people to walk, ride a bicycle or use transit;
- ❖ Allow for a mix of uses designed to attract pedestrians;
- ❖ Achieve a compact pattern of development more conducive to walking and bicycling;
- ❖ Provide a high level of amenities that create a comfortable environment for pedestrians, bicyclists, and other users;
- ❖ Maintain an adequate level of parking and access for automobiles AND INTEGRATE THIS USE SAFELY WITH PEDESTRIANS, BICYCLISTS, AND OTHER USERS;
- ❖ Encourage uses that allow round-the-clock activity around transit stations;
- ❖ Provide sufficient density of employees, residents and recreational users to support transit; and,
- ❖ Generate a relatively high percentage of trips serviceable by transit.

Appendix A

2. Definitions

These definitions shall apply only to the Transit-Oriented District TWO (TOD-2) Overlay District. (* *Definition currently found in Phoenix Zoning Ordinance.*)

Accessory Dwelling – a subordinate dwelling situated on the same lot with the main dwelling and used as an accessory use. *

Accessway – a formalized path, walkway, or other physical connection that allows pedestrians to directly reach destinations.

Arcade – a covered walkway attached to a building and supported on the sides but not attached to the building by columns.

Articulation – the visible expression of architectural or landscape elements through form, structure, or materials that “break up” the scale of buildings and spaces to achieve a “human scale.”

Balcony – an exterior platform that projects from or into the façade of a building and is surrounded by a railing, handrail, or parapet.

Bay Window – a large window or grouping of windows projecting from the outer façade of a building and forming an alcove in the interior of the building.

MOUND – an artificial bank of earth. MOUNDS can physically and visually separate areas and provide visual and physical level changes by raising landscape elements above grade.

Bulk Retail Use or Bulk Sales – a retail or wholesale facility that serves the general public, selling primarily institutional sized or multi-pack products in bulk quantities.

Build-to Line – a given distance from a property line where the façade of the building within that property must be located.

Clear Window – the amount of glass surface of a window that allows 100% visual permeability.

Commercial Parking Facility – a parking structure or a surface parking lot operated for profit that has parking spaces that are not accessory to a primary use. This term does not include a park-and-ride lot.

Compact Development – the planning concept of using site design and urban design techniques to decrease the amount of land needed to develop a given amount of land use. In the case of TOD, this is done with the goal of improving transit access.

Density – the number of dwelling units divided by the gross area. *

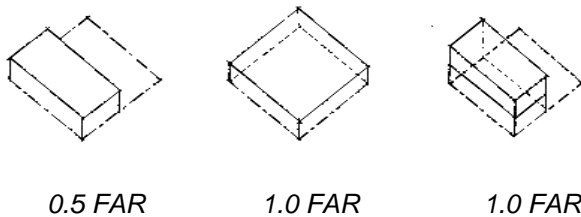
Drive-Through Facility – facilities allowing transactions for goods or services without leaving a motor vehicle.

Appendix A

Fast Food Establishment – a food service business that offers relatively immediate service of semi-prepared or prepared foods for take-out or in-house consumption in disposable containers and serving walk-in and/or drive-through customers.

Finished Floor – the ultimate grade at which a structural floor will be constructed including added decorative and finished surfaces.

Floor Area Ratio (FAR) – the ratio of the gross floor area of the building, excluding those parts of the building specifically excluded, to the gross land area of the site which gross land area may include one half of all abutting streets and alleys which are dedicated to public use. *



Frontage – the linear edge of a property adjacent to the property line abutting a street, or public right-of-way.

Greenway – a singular or a series of vegetative, linear corridors, natural or man-made, which may contain active or passive recreational uses or which may prohibit human activity altogether in order to preserve sensitive areas. These are usually associated with riparian systems, but may also include transportation corridors.

Light Rail Transit (LRT) – a fixed guideway transit system.

Liner Retail – a retail building adjacent to a street and serving pedestrian traffic. It is located at the front of a larger retail site that may also contain large format or “big box” retail uses.

Live-Work – a residential unit that is also used for commercial purposes for a time, with minimum of 25% of the total building area given to the commercial use within the same structure as the residential component.

Loggia – a roofed, but open arcade along the front or side of a building on an upper story.

Mixed-Use – Development contained within a single-parcel (horizontally or vertically) or adjacent parcels that contains different uses that are complementary to each other and provide activity throughout the day.

Open Space – open space, active; open space, common; open space, passive; and open space, usable as defined in Section 202 of the Zoning Ordinance of the City of Phoenix. *

Overhang – the architectural elements of a building that extends horizontally beyond the wall.

Parking Structure – a parking garage located above ground or underground consisting of one or more levels, not surface parking.

Appendix A

Park-and-Ride Lot – A parking structure or surface parking lot intended primarily for use by persons riding transit or carpooling, and that is owned or operated either by a transit agency or by another entity with the concurrence of the transit agency.

Parking, Off-Street – marked or unmarked parking located within a parcel and outside a private or public right-of-way.

Parking, On-Street – marked or unmarked parking located within a private or public right-of-way and outside of a parcel.

Pedestrian – a person who walks, sits, stands, or uses a wheelchair in public spaces.

Pedestrian Activity – the congregation in an area of persons whose primary means of transportation is by foot.

Pedestrian-oriented Design – The design of communities, neighborhoods, streetscapes, sites, and buildings that emphasizes pedestrian access, comfort, and visual interest. Transit-Oriented Design is a particular type of pedestrian-oriented design that includes design and intensity of land use to support transit in addition to pedestrians.

Pedestrian-oriented street – a street where adjacent uses generate and encourage foot traffic.

Pedestrian Scale – the size and proportion of a physical element that closely relates to the human body e.g., a 16-foot lamp post vs. a 30-foot lamp post, and a façade with vertically oriented framed windows vs. a façade with a continuous and unarticulated window wall.

Pedestrian Way – a linear space or an area where the primary users are pedestrians and that may also accommodate bicyclists.

Pergola – an arbor or passageway with a roof or trelliswork on which climbing plants can be trained to grow.

Portico – a porch or walkway with a roof supported by columns, often leading to the entrance of a building.

Porch – an open building used solely for ingress and egress and not occupancy, at least two sides of which shall be at least 50% open. *

Primary Front Façade – the façade of a building fronting onto a public or private street or pedestrian accessway.

Setback – the required minimum distance between the building line and the related front, side or rear lot line over which no part of any building may extend, except as otherwise provided. *

Shared Parking – parking that is utilized by two or more uses taking into account the variable peak demand times of each use; the uses can be located on more than one parcel.

Station Area – the core area of the TOD closest to the transit platform e.g., within 500 feet of the platform.

Appendix A

Street-Facing Facade – the façade of a building that is adjacent to a public or private right-of-way.

Telecom Hotel – a structure dedicated to containing high-tech equipment often supporting remote users.

Transit-Oriented Development (TOD) – a development pattern characterized by a mix of uses surrounding a transit platform where streets have a high level of connectivity, blocks are small, and streetscape, buildings, and uses cater to the pedestrian.

Transit Platform – A designated transit loading and waiting area as assigned by the public transit agency.

Transit Station – the area including the platform which supports transit usage and that is owned by the transit authority.

Transit Street – a street that contains a transit line.

Visual Permeability – the ability of vertical surfaces to allow viewers to see through to the other side e.g., windows and open fencing.

Walking Radius – the distance beyond a central point from which a person is willing to walk. This distance will vary depending on existing barriers, the walking environment, and the availability of destinations.

(* Definition currently found in Phoenix Zoning Ordinance.)

3. Applicability and General Provisions

The City of Phoenix's Transit-Oriented Development Overlay District(s) (TOD) shall apply to lands delineated on the City's official zoning map as adopted on **[insert date]**. All land uses and development including, but not limited to buildings, drives, parking areas, landscaping, streets, alleys, greenways, and pedestrian/bicycle ways designated to be within this district, shall be located and developed in accordance with the following provisions.

- A. For all projects for which preliminary or final Development Services Department site plan or subdivision approval has been obtained prior to the effective date of this overlay district, the standards of the TOD shall not apply. However, if an action (i.e., appeal, modification of stipulations, site plan amendment) alters a stipulated site plan, these standards should be applied in a manner consistent with the subject of the change.
- B. For all projects for which preliminary or final DSD site plan or subdivision approval has not been obtained prior to the effective date of the overlay district, all overlay district standards shall apply.

Appendix A

4. *Inconsistencies of Underlying Districts*

In the event that the underlying zoning district standards, or other ordinance or regulations are inconsistent with these Overlay Zoning Ordinance standards or any other provisions herein, the standards of the TOD-2 district shall apply.

5. *Prohibited Uses*

For property within the Transit-Oriented Development TWO (TOD-2) Overlay District the following uses are prohibited, UNLESS THE USE ALREADY REQUIRES A SPECIAL PERMIT:

- ❖ Car washes
- ❖ Cemeteries
- ❖ Drive-in businesses
- ❖ Exterior display of goods
- ❖ Funeral homes and mortuaries
- ❖ Golf courses including miniature golf courses
- ❖ RV parks or mobile home parks and campgrounds
- ❖ Solid waste transfer stations

FOR SITES WITH EXISTING STRUCTURES/FACILITIES, THESE USES SHALL NOT BE PROHIBITED UNTIL JANUARY 1, 2014. AFTER JANUARY 1, 2014 PROPERTY OWNERS WITHIN THE TOD DISTRICT MAY REQUEST THAT THE PLANNING COMMISSION INITIATE AN APPLICATION FOR A SPECIAL PERMIT TO PERMIT USES OTHERWISE PROHIBITED BY THIS PARAGRAPH 5, BUT WHICH ARE ALLOWED BY THE UNDERLYING ZONING.

6. *Uses Requiring Conditional Use or Use Permit*

For property within the TOD Overlay District TWO (TOD-2) the following uses are considered uses that are conditional and that require Use Permits.

- ❖ Drive-through facilities
- ❖ Fast-food establishments
- ❖ Grocery stores with building footprints over 50,000 square feet

Appendix A

- ❖ Liquor, retail sales and package retail sales
- ❖ Outdoor recreational uses
- ❖ Parking, accessory to a permitted use, that exceeds automobile parking maximum regulations as outlined within *Section 11.1 Automobile Parking Requirements Per Floor Area or Unit Size and Land Use Type*
- ❖ Parking facilities (commercial) or principal use parking (structured or surface)

CONDITIONAL USES ARE SUBJECT TO SECTION 307.A.7.b. – h., 8, 11 – 13 AND THE FOLLOWING CRITERIA WITH REVIEW AND APPROVAL OF THE ZONING ADMINISTRATOR. THE ZONING ADMINISTRATOR SHALL GRANT THOSE SPECIAL EXCEPTIONS DESIGNATED AS USE PERMITS WHERE REQUIRED UPON A FINDING THAT THE USE COVERED BY THE PERMIT, OR THE MANNER OF CONDUCTING THE SAME:

- A. WILL PROVIDE SUFFICIENT A MINIMUM DENSITY OF 1 EMPLOYEE AND/OR USER FOR EVERY 500 SQUARE FEET OF GROSS BUILDING AREA EXCLUSIVE OF ANY PARKING FACILITIES.
- B. WILL PROVIDE ARCHITECTURAL MATERIALS AND/OR LANDSCAPE ELEMENTS THAT ‘BREAK UP’ THE SCALE OF BUILDINGS AND SPACES TO ACHIEVE A PEDESTRIAN SCALE.
- C. WILL BE BUILT IN A COMPACT FORM OR MANNER TO DECREASE THE AMOUNT OF LAND NEEDED TO DEVELOP THE GIVEN AMOUNT OF LAND USE.
- D. WILL PROVIDE BUILDING(S) THAT EMPHASIZES PEDESTRIAN ACCESS, COMFORT AND VISUAL INTEREST WITH SAFE AND COMFORTABLE SEPARATION FROM VEHICLE ACCESS TO THE BUILDING AND SITE.
- E. WILL NOT CONTRIBUTE IN A MEASURABLE WAY TO THE DETERIORATION OF THE NEIGHBORHOOD OR AREA, OR CONTRIBUTE TO THE DOWNGRADING OF PROPERTY VALUES.

7. Non-Conforming Uses

USES PROHIBITED IN THE TRANSIT-ORIENTED DEVELOPMENT TWO (TOD-2) DISTRICT WHICH EXISTED LEGALLY PRIOR TO THE EFFECTIVE DATE OF THE OVERLAY DISTRICT AND BECAME NON-CONFORMING DUE TO THE OVERLAY DISTRICT MAY EXPAND ON THE SAME OR ADJACENT PARCEL UNDER THE FOLLOWING CONDITIONS:

- 1. EITHER OWNED OR LEASED AT THE TIME THE TOD-2 ORDINANCE BECAME EFFECTIVE.

Appendix A

2. BE DEVELOPED UNDER THE CONDITIONS AND DEVELOPMENT STANDARDS OF THIS DISTRICT.
3. THE UNDERLYING ZONING PERMITS THE USE.

IF THE ADJACENT PARCEL WAS NOT OWNED OR LEASED AT THE TIME THE TOD-2 ORDINANCE BECAME EFFECTIVE, THE PROPERTY OWNER MAY APPLY FOR A SPECIAL PERMIT.

8. *Development Standards for Permitted Uses*

For the purpose of sections 8.1 and 8.2, distances shall be measured from the entrance to the station platform to the parcel line.

8.1 Setbacks and Build-To Lines

8.1.1 *Setbacks and Build-to Lines for Non-Residential and Mixed-Uses*

The following standards shall apply to new non-residential and mixed-use development within the TOD Overlay TWO (TOD-2) District.

**Table 8.1.1: Non-Residential & Mixed-Use
Setbacks and Build-to Lines**

Distance from Station	Max. Building Setback
0 – 1000 feet	6 feet
1000 – 2000 feet	12 feet

Where ground level retail uses are present, setback may be increased up to 12 feet for outdoor seating, PATIO DINING, or retail sales by securing a use permit in accordance with provisions of PARAGRAPH 6 ABOVE.

Features such as overhangs, porticos, balconies, loggias, arcades, covered (non-enclosed) bicycle parking, pergolas, and similar architectural features placed on the front (street-facing) side of the building are allowed within the setback.

8.1.2 *Setbacks and Build-to Lines for Residential Uses*

The following standards shall apply to new residential development within the TOD Overlay District except where the underlying district is the Urban Residential (UR) District.

Appendix A

Table 8.1.2: Residential Setbacks and Build-to Lines

Distance from Station	Max. Building Setback
0 – 1000 feet	8 feet
1000 – 2000 feet	18 feet

Features such as front porches, overhangs, porticos, balconies, loggias, arcades, covered (non-enclosed) bicycle parking, pergolas, and similar architectural features placed on the front (street-facing) side of the building are allowed within the setback.

8.2 Building Frontage, Facade, and Entry Regulations

8.2.1 Building Frontage and Façades

In order to support the pedestrian-oriented environment within the TOD station area, building frontages onto streets and open spaces shall be maximized. Building frontage within the TOD Overlay TWO (TOD-2) District shall achieve the requirements as outlined in the following table:

Table 8.2.1: Building Frontage

Distance from Station	Min. Building Frontage as a Percentage of Lot Frontage
0 – 500 feet	75%
500 – 2000 feet	65%

All structures shall require clear windows. Clear windows shall encompass, at a minimum, 50% of the building façade length fronting onto a street within the area from 3 feet to 6 feet-8 inches above adjacent interior finished floor and adjacent sidewalk grade. Blank walls shall not occupy over 30% of the principal frontage for non-residential buildings and 50% for residential buildings, and a section of blank wall shall not exceed 20 linear feet without being interrupted by a window or entry.

8.2.2 Building Entry

If a building lot or parcel abuts a transit platform, transit station, transit street, or a major pedestrian accessway, at least one main building entry shall be oriented to the adjacent transit platform, transit station, transit street and/or primary pedestrian accessway. A pedestrian way shall be provided from the building entry to the transit platform, transit station, transit street or major pedestrian accessway.

To allow for their use, residential porches of single-family detached units, located at ground level, shall have a minimum depth of 6 feet and shall be a minimum of 50 square feet.

Appendix A

8.2.3 BUILDING AND SHADE

DEVELOPMENT DIRECTLY ABUTTING A SIDEWALK OR PEDESTRIAN WAY SHALL PROVIDE SHADING WITH METHODS SUCH AS AWNINGS AND ARCADES

8.3 Large SCALE RETAIL COMMERCIAL

Large SCALE RETAIL COMMERCIAL stores in excess of 80,000 square feet shall not front the street with parking lots. Instead, “liner” buildings shall be required and shall front onto pedestrian oriented streets, and shall follow setback and build-to regulations as outlined within *Section 8.1 Setbacks and Build-to Lines for Non-Residential and Mixed-Uses* of this ordinance. Liner buildings should be a minimum depth of 30-feet.

The portion of the building fronting onto a transit station, a transit street or a major pedestrian accessway (pass-throughs, sidewalks, plazas, etc.) shall follow building design regulations as set out in *Section 8.2 Building Frontage, Façade and Entry Regulations* of this ordinance.

Large SCALE RETAIL COMMERCIAL stores shall be lined with pedestrian-oriented retail frontages along a transit street, pedestrian accessways or sidewalks, to allow more pedestrian-friendly uses to line accessways.

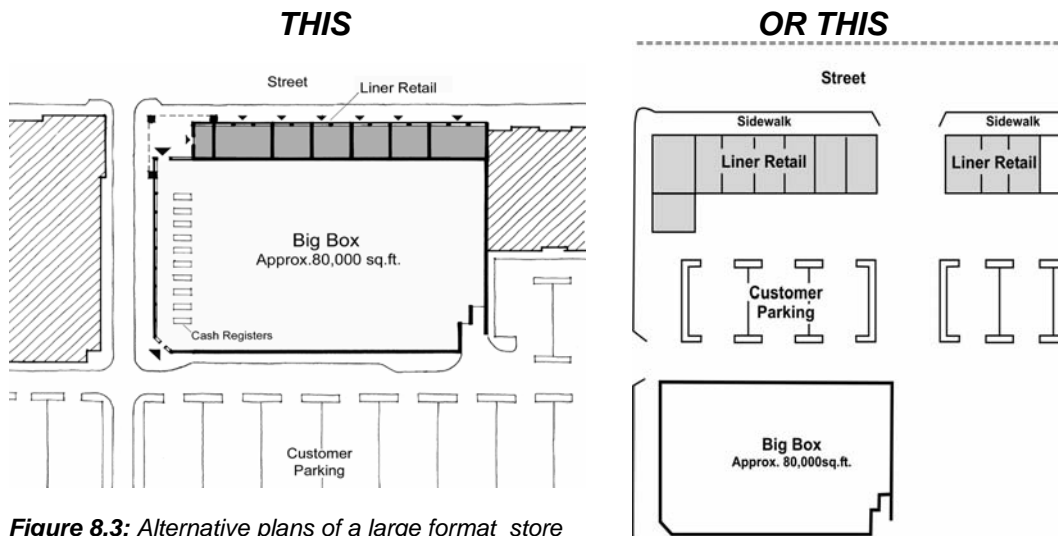


Figure 8.3: Alternative plans of a large format store using liner retail to improve its interface with street

Appendix A

9. Street and Sidewalk Regulations

9.1 Minimum Widths

Sidewalks within the TOD Overlay TWO (TOD-2) District shall have a minimum 8-foot unobstructed space from any obstruction (light poles, parking meters, other street furniture, landscaping or fences) for circulation with the exception of residential areas with a density of less than 12 units per acre where the width may be reduced to 6 feet.

9.2 Private Use of Sidewalks

Exterior storage on sidewalks is prohibited. Outdoor seating for food and drink establishments and pedestrian-oriented accessory uses, such as sales display for flowers, small shops, food, or drink stands, are exempt from this requirement subject to obtaining a use permit and a revocable permit where within the public right-of-way. Outdoor service of alcoholic beverages shall be clearly demarcated from public spaces. In all cases, a minimum 8-foot unobstructed pedestrian circulation path shall be maintained along the sidewalk.

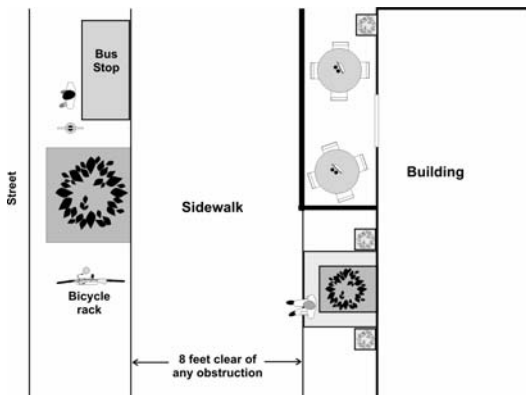


Figure 9.2. Use of sidewalks and maintenance of 8-foot clear pedestrian path.

10. Sign Regulations

New signage within the TOD Overlay TWO (TOD-2) District shall conform to the standards stated herein and Section 642.G of the Zoning Ordinance of the City of Phoenix except for signs painted or mounted directly to the building surface. These signs shall be governed as follows:

Signs painted on the building surface or letters mounted directly to the building surface shall:

Appendix A

1. Be a maximum of one (1) square foot of signage for each lineal foot of building elevation to a maximum of one hundred (100) square feet for each business.
2. Have letters no larger than twelve (12) inches in height for building fronts thirty (30) feet in height or less; eighteen (18) inches in height for building fronts thirty (30) feet – sixty (60) feet in height; twenty-four (24) inches in height for building fronts sixty (60) feet in height or greater.
3. Extend no closer than one-half (1/2) the vertical height of the letters employed to a building corner (vertical edge) or to a roofline.

Signage may be increased by up to twenty-five (25) percent by submitting a comprehensive sign plan as provided in the Phoenix Sign Code, Section 705.E. In addition to the standards enumerated in Section 705. E, findings of approval shall include:

1. The signs and other displays are appropriate in scale, composition, and manner of display with surrounding development.
2. Content is limited to logos, graphics, business and project name.

Signage shall not reduce unobstructed sidewalk width to less than 8 feet. Opaque signage shall not reduce visual permeability of street-fronting windows to less than the minimum clear window requirement within *Section 8.2.1: Building Frontage and Façade* of this ordinance.

11. Parking and Loading Regulations

11.1 Automobile Parking Requirements Per Floor Area or Unit Size and Land Use Type

For new development within the TOD Overlay TWO (TOD-2) District, the number of required parking spaces (on-street and off-street) shall be based upon the CITY OF PHOENIX STANDARD, SECTION 702.A.3. OF THE ZONING ORDINANCE. THE MAXIMUM NUMBER OF SPACES ALLOWED SHALL NOT EXCEED 125 PERCENT OF THE CITY REQUIREMENT.

11.2 On-Street Parking

For new development occurring within the TOD Overlay TWO (TOD-2) District, on-street parking along the use's lot frontage shall count towards the parking requirements for uses on the lot set forth within the regulations of this Overlay District. This count shall be rounded to the nearest whole number.

Appendix A

11.3 Bicycle Parking

Convenient bicycle facilities should also be provided within the TOD(-2) district. The following bicycle parking requirements shall be applied within the TOD(-2) district. Bicycle parking shall be provided at 1 space per 2,000 square feet of commercial floor area.

11.4 Off-Street Parking Location

11.4.1 *Non-Residential and Multi-Family Uses*

11.4.1.1 *Surface Parking Lots*

Off-street parking location for new development within the TOD Overlay TWO (TOD-2) District shall conform to the following requirements:

Off-street parking shall be located to the rear and/or interior of a lot such that its visibility from a street shall be minimized. At-grade, above-, or below-ground parking structures shall be permitted.

Surface parking lots shall be placed between the structure and a side or rear lot line. Where a lot fronts onto two or more streets, parking shall be located accordingly:

- ❖ Along the street with the least amount of commercial activity
- ❖ Along the street with the least amount of pedestrian activity if the lot is located along two or more commercial streets with equal amounts of commercial activity.

A maximum 6-foot high wall or fence shall separate parking lots from abutting residential uses with a minimum 5-foot landscaped buffer. Walls and fences shall be constructed of materials comparable with those used in abutting residential uses.

Appendix A



Figure 11.4.1.1a: Conventional parking and access configuration

Figure 11.4.1.1.b: Preferred parking and access configuration

11.4.1.2 Structured Parking

For a parking structure which abuts a transit station, a transit street or a major pedestrian accessway, at least fifty (50) percent of the structure face, excluding entrances and exits, shall have non parking use at ground level and shall comply with building frontage and facades and building entry requirements in Section 8.2.1 and 8.2.2 of this chapter.

Wherever possible, the narrow side of the parking structure shall abut the transit station, transit street or major pedestrian accessway.

11.4.2 Single-Family Residential Uses

Garages, whether attached or detached, shall be set back at least 10 feet behind the primary front façade of the buildings they serve. The primary front façade (non-garage portion of the structure) shall comprise at least 50% of the overall width of the primary residence and the 10-foot setback shall not be measured from projections such as bay windows and porches, but from the façade of the wall which encloses the building.

Using driveways as the primary access between the sidewalk and the house shall be avoided. Instead, the main entrance to the house shall be from a walkway or terrace directly leading to the sidewalk.

Appendix A

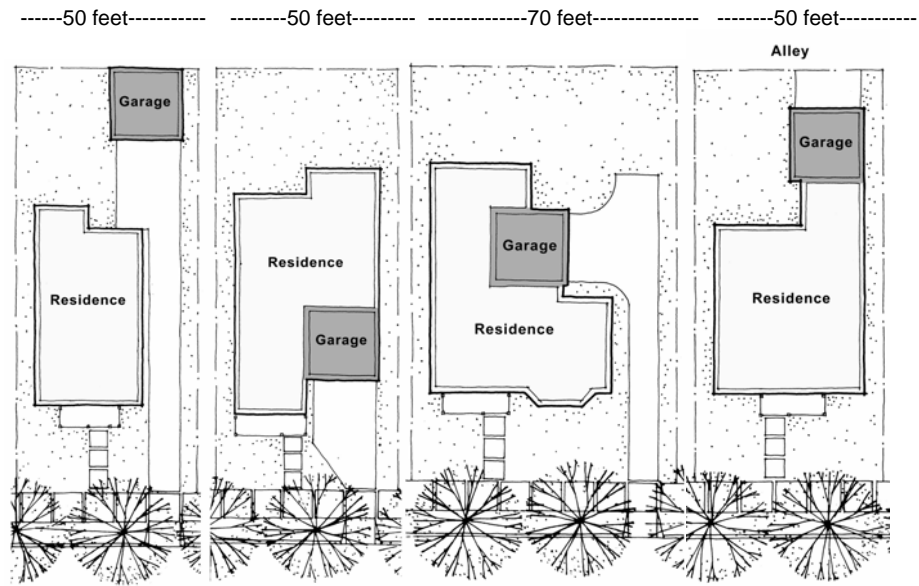


Figure 11.4.2: Preferred single-family residential garage setback

Appendix A

11.5 Location of Vehicle Access

Vehicle access from pedestrian-oriented streets shall be prohibited unless no other reasonable access is available, such as in lots with a single street frontage and no alley. Where SUITABLE alleys are present, loading and service areas shall be accessed from the alley. Lots with more than one street frontage and no alley shall locate vehicular access along the street with the least amount of pedestrian activity unless it is a local street. All loading and service drives shall be of a depth that prevents loading and service vehicles from obstructing the sidewalk and roadway.

Entrances to loading and service areas shall be screened from view. For screening regulations see Section 507, Tab A of the Zoning Ordinance of the City of Phoenix.

11.6 Loading and Service Area Location

Loading, service, and refuse areas shall not be located at the front of the lot. They shall be screened from view with walls, trellises, planting, berms, or by integration into the design of the building. Walls shall not exceed 6 feet in height. Solid walls shall be landscaped to soften their appearance and shall be made of finished materials to match the primary building. Decorative elements, variation in materials, and articulation shall be used.

Loading areas and access lanes shall be physically separated from public parking via curbs, bollards, low or high walls, raised planters, landscaping, distance, and/or elevation changes.

When using walls to separate loading areas from pedestrian areas, landscape elements (e.g. planting, trellises, arbors, etc.) shall be used on the outside of walls to soften their appearance.

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